

Claims

1. A ball screw device comprising:

a screw shaft comprising a spiral first screw groove on an outer periphery thereof;

5 a nut screw-engaged with the screw shaft, comprising:

a spiral second screw groove formed on an inner periphery thereof corresponding to the first screw groove; and

a pair of circulating holes on side surface thereof;

10 a plurality of rolling elements rollably mounted in a load region formed between the first and second screw grooves;

a circulating member made of resin, comprising:

a rolling-element circulating path formed therein, which introduces the rolling element rolling in the load region

15 from one of the pair of circulating holes to an outside of the nut, and also returns the rolling element to the load region via other of the pair of circulating holes; and

both ends fitted to the pair of circulating holes;

and

20 a metallic holding member for fixing the circulating member onto the nut.

2. The ball screw device according to claim 1, wherein the holding member is manufactured by sheet metal press processing.

3. The ball screw device according to claim 2, wherein the holding member is manufactured by drawing processing.

4. The ball screw device according to claim 1, wherein the holding member covers 60 % or more of a part of the circulating member, which is exposed from the side surface of the nut.

5. The ball screw device according to claim 1, wherein a rib for reinforcement is provided on the holding member.

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6. The ball screw device according to claim 1, wherein a convex is formed at a part of a bent portion of the holding member.

15 7. The ball screw device according to claim 1, wherein the circulating member comprises legs which fit in the circulating holes of the nut at both ends thereof, and

wherein a path for scooping up the rolling elements and a path for returning the rolling elements are formed in the legs so as to be inclined relative to an outer periphery of the leg, respectively.

8. A ball screw device comprising:

a screw shaft comprising a spiral first screw groove on an outer periphery thereof;

a nut screw-engaged with the screw shaft, comprising:

a spiral second screw groove formed on an inner periphery thereof corresponding to the first screw groove; and

a pair of circulating holes on side surface

5 thereof;

a plurality of rolling elements rollably mounted in a load region formed between the first and second screw grooves;

a circulating member made of resin, comprising:

a rolling-element circulating path formed therein,

10 which introduces the rolling element rolling in the load region from one of the pair of circulating holes to an outside of the nut, and also returns the rolling element to the load region via other of the pair of circulating holes; and

both ends fitted to the pair of circulating holes;

15 and

a metallic holding member for fixing the circulating member onto the nut, formed by sheet metal press processing,

wherein a bent portion for reinforcement is provided on a seat of the holding member for the nut.

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9. The ball screw device according to claim 8, wherein the circulating member comprises legs which fit in the circulating holes of the nut at both ends thereof, and

wherein a path for scooping up the rolling elements and

25 a path for returning the rolling elements are formed in the

legs so as to be inclined relative to an outer periphery of the leg, respectively.